REMARKS

Applicant wishes to thank the Examiner for the courtesy of his comments on the Title and the claims under 35 U.S.C. § 112. It is believed that the amendment of the claims and the deletion of Claims 34-37 address the formality matters.

The Office Action rejected Claims 1-8, 10-19 and 21-43 as being either anticipated or rendered obvious over the *Kurogi et al.* (U.S. Patent No. 6,495,957) and supplemented this teaching with observations as to what would be obvious to a person of ordinary skill in this field.

The Office Action further rejected Claims 9 and 20 over a combination of the *Kurogi et al.* reference in view of the *Shirozu* (U.S. Patent No. 6,541,922).

The present application has an effective U.S. filing date of January 21, 2000, which is before the prior art filing date of December 29, 2000 for the *Shirozu* reference, and accordingly, it is believed that the rejection of Claims 9 and 20 is improper.

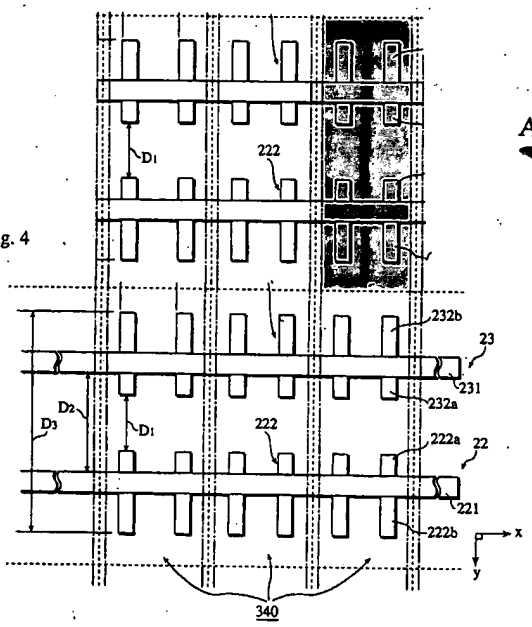
The field of gas discharge panels and plasma display panels is relatively crowded in view of the concentrated effort that has been made by numerous large electronic companies, including the present assignee. The effort to improve both the efficiency in manufacturing and the performance of the current products has been a constant goal in this field. It is submitted that the present invention as defined by the present claims represents a significant improvement worthy of patent protection.

The present invention attempts to lower a discharge firing voltage while minimizing energy consumption. The design of providing a discharge gap between the respective display electrodes encourages an expansion of the discharge which is initiated at a gap between a pair of inner protrusions and which will expand, for example, elliptically along the length of the cell until it reaches the outer protrusions. This discharge capacity will contribute to an illumination

of the cell over a wide area. The present invention utilizes transparent electrode material for forming the isolated electrodes in areas that will contribute effectively to illuminating the cells. The particular configurations to achieve this purpose are set forth in the specific examples defined in our specification and in our Figures.

It is important to understand the definition of a "cell" as described in our present specification and shown in our figures compared to the cited art. In this regard, our cells are defined as an elongated rectangular area between the barrier ribs 30 having a cell pitch Ps. Thus, in Figure 4, the cell is defined as element 340, and three cells will make up a square pixel corresponding to the colors RGB. This definition of cell is carried forward into our claims and is supported by our specification, and as can readily be determined, the area of the cell will encompass an X display electrode 23 and a Y display electrode 22 and further comprises isolated electrodes or protrusions of a pitch Pe smaller than the cell pitch Ps, and these isolated electrodes can be further sub-defined as an inner protrusion and an outer protrusion. The gap between a respective inner protrusion of an X display electrode and an inner protrusion of a Y display electrode will define a discharge gap, and along with the particular pressure of the discharge gas in the cell, will be set to achieve a sufficient sustain discharge capacity. Conversely, the gap between the outer protrusions and their corresponding adjacent cells in, for example, the Y direction of Figure 4, will be set at generally a larger distance to prevent the occurrence of cross-talk between the adjacent cells.

Fig. 4



As can be seen above, three cells 340 constitute a pixel, and within the definition of the cell, are the inner and outer protrusions, such as the inner protrusions 222a and 232a, and the outer protrusions 222b and 232b as marked in yellow. Accordingly, our definition of cell includes a surface area that comprises not only the bus strips for the respective display electrodes 22 and 23, but also the isolated electrodes 222 and 232 that extend in the Y direction.

As shown by the cell marked in yellow, the gap D1 is set according to Paschen's law and, because of the effect of the isolated electrodes 222 and 232, the voltage needed to generate the discharge is kept at a lower level to create energy conservation. The surface area, however, of the cell for the display electrodes 22 and 23 expands to the outer sides of the parallel bus lines 221 and 231 when a discharge has been fired and is being sustained. As noted on page 19 of our present specification, the discharge generated within the discharge gap D1 can expand

elliptically until it reaches the outer protrusions 222b and 232b. Thus, a discharge capacity will contribute to illumination of the cell over a wide area.

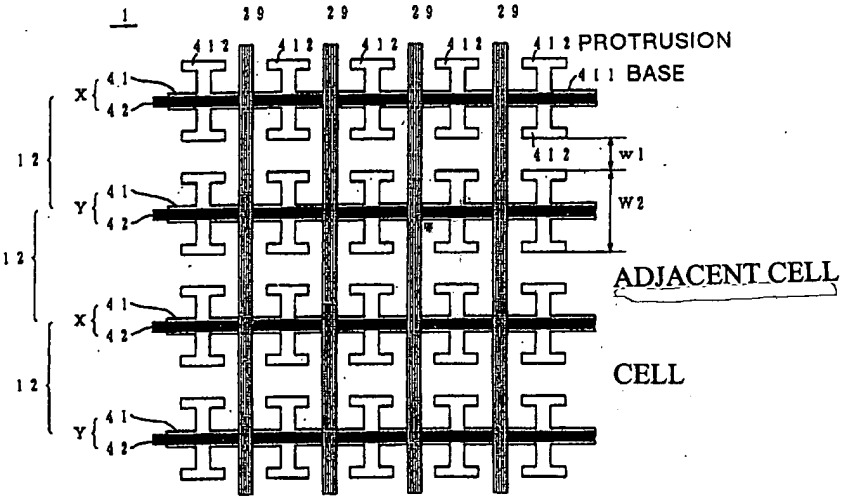
As can be seen from several of our other embodiments, the luminous efficiency of the sustain discharge is increased by the outer protrusions and additionally increasing the number of outer protrusions can further increase the illumination efficiency.

These design features of our present invention should be compared with the teachings in the *Kurogi et al.* (U.S. Patent No. 6,495,957) wherein a cell C is defined as only existing between a respective display electrode X and display electrode Y as shown in Figure 1.

This can be further illustrated in Figure 3 of the *Kurogi et al.* reference as follows:

United States Patent
Kurogi et al.

FIG. 3



As can be seen by a comparison of the yellow cells of Figure 4, as further defined in our claims, and the *Kurogi et al.* yellow cell of Figure 3, it is readily apparent that the *Kurogi et al.* reference does not teach outer protrusions within the boundary of a cell to increase luminous nor disclose the advantages of an increased luminous efficiency and discharge capacity that can be realized by our outer protrusions.

Referring to Claim 1 (Amended), we further define one or more outer protrusions arranged within our cell.

Referring to our independent Claim 21, we define a specific arrangement of our inner protrusions within each cell so that the ends of the inner protrusions are out of alignment along the row direction of the matrix. This feature can be found in Figures 12 through 16 of our drawings. A review of each of the embodiments disclosed in the *Kurogi et al.* reference suggests a symmetrical alignment in each of the embodiments. Figure 8 does not show an out of alignment of inner protrusions since the most distal edges of the inner protrusions are parallel and in alignment to define the discharge gap.

Finally, our independent Claims 28 and 33 further define a serpentine or snaky configuration as can be seen in Figures 9 through 11 of our present application. In each of these embodiments, however, the cell as defined will include both the inner and outer protrusions regardless of the specific configuration.

The *Kurogi et al.* reference does not teach such features. In fact, the *Kurogi et al.* reference actually wishes to limit or prevent the expansion of discharges in the column direction as noted on Column 2, Lines 34-36, to improve resolution of a cell which is positioned between the display electrodes. Another feature of the *Kurogi et al.* disclosure is that the main electrodes are exposed equidistantly with constant width having partial cutoffs in such a manner that cells

will have an equal electrode area. Since the electrode field is not generated at the cutoff portion, the discharge produced on one side of the main electrode can be prevented from expanding to the other side. See Column 2, Lines 46-52. This feature has been recognized by the *Kurogi et al.* reference to decrease the current, but also at the cost of declining brightness which then must be compensated by rising the frequency of the drive voltage for sustaining light emission. See Column 2, Lines 52-57. See also Column 6, Lines 10-25.

In reviewing each of the different embodiments disclosed, a feature of the teaching of the *Kurogi et al.* reference is suppressing the expansion of surface discharges in the column direction. See Column 8, Lines 53-55; Column 9, Lines 27-29. Thus, this teaching should be compared, for example, to the teaching of the present invention wherein the surface area of our display electrodes contributes to the discharge expanding to the outer side of the parallel bus lines 221 and 231 when there has been a discharge, and it is being sustained. See specifically Page 18, last paragraph, over to Page 19 of our specification.

There are a number of evaluations required under Section 103. One highly relevant inquiry is "[t]he relationship between the problem which the inventor . . . was attempting to solve and the problem to which any prior art reference is directed." *Stanley Works v. McKinney Manufacturing Co.*, 216 USPQ, 298, 304 (Del. D.C. 1981). Thus, in analyzing the prior art under Section 103 of the Act, we must clearly comprehend the problems addressed by the present inventors and those problems must be compared or contrasted, as the case may be, with the problems addressed by the prior art.

Pursuing further the "problem" analysis required under Section 103 of the U.S. Patent Act, the applicability of any reference against the claims of a pending U.S. patent application requires compliance with *In re Gibbons*, 100 USQP 398, where it stated:

> In considering the questions of the invention, it is necessary to determine whether or not the art relied upon contains adequate directions for the practice of the invention without resort to the involved application. (Emphasis added.)

The Office Action cannot find support in the *Kurogi et al.* reference for the requisite "adequate directions" sufficient to reach the presently claimed combination "as a whole" by reliance upon the prior art without hindsight dependence upon the present application. Since the prior art relied upon is neither intended or able to achieve what the present applicants have achieved, e.g., an increased illuminance by having a discharge capacity over a wide area within a cell by specifically designing the isolation electrodes to form an elongated cell.

In *Orthopedic Company, Inc. v. United States*, 217 USQP 193 (C.A.F.C. 1983), the Federal Circuit set forth a useful guide for determining the scope and content of the prior art. *Orthopedic*, at pages 196-197, also focuses on the "problem" faced by the inventors:

> In determining the relevant art . . . one looks at the nature of the problem confronting the inventor.
>
> * * * *
>
> [W]ould it then be nonobvious to this person of ordinary skill in the art to coordinate these elements in the same manner as the claims in suit? The difficulty which attaches to all honest attempts to answer this question can be attributed to the strong temptation to rely on hindsight while undertaking this evaluation. It is wrong to use the patent in suit [the patent application before the Examiner] as a guide through the maze of prior art references, combining the right references in the right way so as to achieve the result of the claims in suit. Monday morning quarterbacking is quite improper when resolving the question of nonobviousness . . . . (Emphasis added.)

It is recognized that on the surface, the *Kurogi et al.* reference appears to be relevant since it does address some of the features of the present invention. However, the manner in

which the display electrode structure is defined in relationship to the individual cell boundaries is markedly different than that of the present invention.

> Thus when differences that may appear technologically minor nonetheless have a practical impact, particularly in a crowded field, the decision-maker must consider the obviousness of the new structure in this light.
>
> *Continental Can Co. USA Inc. v. Monsanto Co.*,
> 20 USPQ 2d 1746, 1752 (Fed Cir. 1991).

In summary, not only are independent claims that are discussed above more than adequately distinguished over the teachings of the *Kurogi et al.* reference, but our dependent claims further define specific features that are not found nor taught in any one of the embodiments of the *Kurogi et al.* disclosure. It is believed that the Office Action was misled by its interpretation of what was the actual structure of the cell configuration since the terminology "cell" is not a definitive term of art in this field. The cell as described in our application and claims and its relationship with an increased discharge capacity on the outer protrusions is significantly different from that of the teaching of the *Kurogi et al.* invention.

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It is respectfully submitted that the present application is now in condition for allowance, and an early notification of the same is requested. If the Examiner believes that a telephone interview will help further the prosecution of this case, the undersigned attorney can be contacted at the listed telephone number.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on December 29, 2003.

By: James Lee

Signature

Dated: December 29, 2003

Very truly yours,

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